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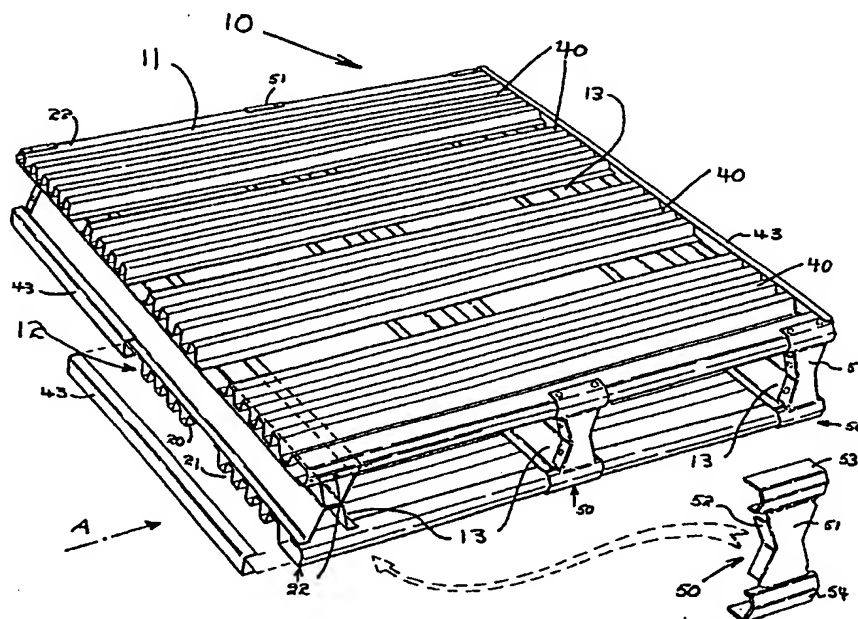
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(54) Title: MATERIAL HANDLING PALLET



(57) Abstract

A steel material handling pallet (10) has a deck (11) of corrugated planks (40) and a base (12) of corrugated portions (20, 21) welded to bearers (13). Each bearer (13) consists of a pair of U-shaped channels (30, 31) each having a web portion (32) and sloping legs (33, 34). The angle between legs (33, 34) and the webs (32) is between 90° and 120° to provide optimum strength in respect of uniformly distributed loads, bending loads and shear loads.

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MATERIAL HANDLING PALLETFIELD OF INVENTION

This invention relates to pallets of the kind used for transport of a wide variety of goods and commodities.

5 BACKGROUND ART

Wooden pallets are widely used but suffer from several disadvantages not the least of which is that they are easily damaged. Furthermore, wooden pallets readily absorb moisture which leads to increased weight and often to
10 degradation of the timber.

Various metal pallets have been proposed but none has achieved commercial success, mainly because of the bulk of the metal pallet and/or its cost.

It is, therefore, an object of this invention to
15 provide an improved pallet which is so designed that it may be constructed of lightweight material without sacrifice of its load carrying capacity.

DISCLOSURE OF THE INVENTION

According to the invention there is provided a pallet
20 comprising a deck, a base, and a plurality of bearers therebetween, characterised in that each bearer is of an H-shape having upper and lower pairs of leg portions above and below an intermediate web, said leg portions being inclined at an oblique angle to the intermediate web, and said upper legs
25 of each bearer being connected to the deck and the lower legs of each bearer being connected to the base.

The invention also provides a pallet comprising a deck,

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a base and a plurality of bearers therebetween characterised in that each bearer consists of a pair of U-shaped channels each having a web portion, sloping leg portions each at an oblique angle to the web portion and outwardly directed
5 flanges at the free end of the leg portions, said channels being connected together at their web portions with the flanges of one channel being connected to the deck and the flanges of the other channel being connected to the base.

Preferably, each bearer is formed by welding two
10 channel members together by their webs with the open face of each channel being outwardly directed. The outwardly directed flanges at the free end of the legs of the upper channel are welded to the pallet deck and the flanges of the lower channel are welded to the pallet base.

15 DESCRIPTION OF DRAWINGS

In order that the invention may be more readily understood and put into practical effect reference will now be made to the accompanying drawings in which:

- 20 Fig. 1 is a perspective view of a pallet according to one embodiment of the invention,
Fig. 2 is a partially broken away end view of the pallet shown in Fig. 1, taken in the direction of arrow A,
Fig. 3 is an enlarged end view of a plank of the deck
25 of the pallet shown in Fig. 1,
Fig. 4 is an enlarged end view of a bearer of the pallet shown in Fig. 1,
Fig. 5 is an end view of an alternative side channel for the pallet shown in Fig. 1, and,

Fig. 6 is an end view of a protection cap for the pallet shown in Fig 1,

DESCRIPTION OF PREFERRED EMBODIMENT

The pallet 10 shown in the drawings has a load-
5 supporting deck 11, a base 12 and three bearers 13 connected
between the deck 11 and the base 12. The deck 11 has four
planks 40 which are formed from a light gauge, high strength
steel sheet which is pressed into the corrugated shape shown
in Fig. 3. In this instance, the pitch (P) of each
10 corrugation is 75mm and the height of each corrugation
is approximately 23mm. However, the corrugation pitch (P)
can be varied as desired to accommodate variations in pallet
size. The deck 11 could be of any desired shape of
configuration. For example, there could be more or less
15 planks 40 closer together or further apart, or the
deck 11 could be continuous.

As shown in Fig. 3, the plank 40 has top webs 14
and bottom webs 16 interconnected by leg portions 15.
Although the top web 14 of the plank 40 is shown as being
20 horizontal it may, of course be curved.

As indicated in Fig. 1, the base 12 consists of a
central corrugated plank 20 and two side planks 21. Side
channels 22 are fitted along the outer extremities of the
outer planks 40 of the deck 11 and the side portions 21 of
25 the base 12. As can be seen in Fig. 2, each side channel
22 has a flange 41 by means of which the channel 22 is
welded to the bearers 13. The channels 22 have a bull-nose
portion 43 at their extremities as shown in Fig. 2. A side
strip 43 may be fitted over the ends of the planks of the
30 deck and the portions 20, 21 of the base 12 as indicated in
Fig. 1

An enlarged view of the bearer 13 is shown in Fig. 4. In this instance, the bearer 13 consists of an upper channel 30 and a lower channel 31 which are welded together at their webs 32 with the open mouth of each channel extending outwardly. Each channel 30, 31 has sloping leg portions 33, 34 at an oblique angle (W) to the webs 32. At the free end of the leg portions 33, 34 there are outwardly directed flanges 35 by means of which the bearer 13 is welded to the deck 11 and to the base 12. As indicated in Fig. 4, the width of each flange 35 is approximately half that of the web 32. In one embodiment of the invention the web 32 is effectively 27mm wide, the leg portions 33, 34 effectively 47mm wide and the flanges 35 effectively 15mm wide.

The choice of the angle (W) of the leg portions 33, 34 the web is a compromise between the optimum angle for each of the loads to which a pallet may be subjected. In the case of a load uniformly distributed across the deck 11, the optimum angle (W) is zero - that is the leg portions 33, 34 should be vertical. In the case of bending arising from point loads applied between the bearers 13, the optimum angle (W) is zero, however, the width of the web 32 is somewhat critical. In the case of shear (ie: a load is applied along the deck 11 and along the base 12, but in opposite directions, the optimum angle (W) is 30°.

Taking all these factors into account, and preferred angle (W) is 15°, however, angles between zero and 30° will suffice in certain circumstances. Thus, the angle between the leg portions and the intermediate web may be from 90° to 120° with 105° being preferred.

The side channel shown in Fig. 5 is substantially similar to that shown in Fig. 2 except that the bull-nose 42a has an arcuate configuration.

An advantage of the construction of a pallet according to the invention is that the pallet may be adapted to conform

to relevant Standards. Furthermore, the optimum choice of the angle between the leg and the web of each channel of the bearer and the choice of an appropriate high strength material leads to a pallet of unique lightness and strength.

- 5 Various modifications may be made in details of design and construction without departing from the scope and ambit of the invention. For example, a closure plate 50 may be welded across the ends of each bearer 13 as shown in Fig 1
- 10 The closure plate 50 has a central portion 51 having side flanges 52 that are welded to the leg portions 33, 34 of the bearers 13. End caps 53, 54 engage over and are welded to the side channels 27 of the deck 11 and base 12.

CLAIMS

1. A material handling pallet comprising a deck, a base, and a plurality of bearers therebetween, characterised in that each bearer is of an H-shape having upper and lower pairs of leg portions above and below an intermediate web, said leg portions being inclined at an oblique angle to the intermediate web, and said upper legs of each bearer being connected to the deck and the lower legs of each bearer being connected to the base.

2. A material handling pallet comprising a deck, a base and a plurality of bearers therebetween characterised in that each bearer consists of a pair of U-shaped channels each having a web portion, sloping leg portions each at an oblique angle to the web portion and outwardly directed flanges at the free end of the leg portions, said channels being connected together at their web portions with the flanges of one channel being connected to the deck and the flanges of the other channel being connected to the base.

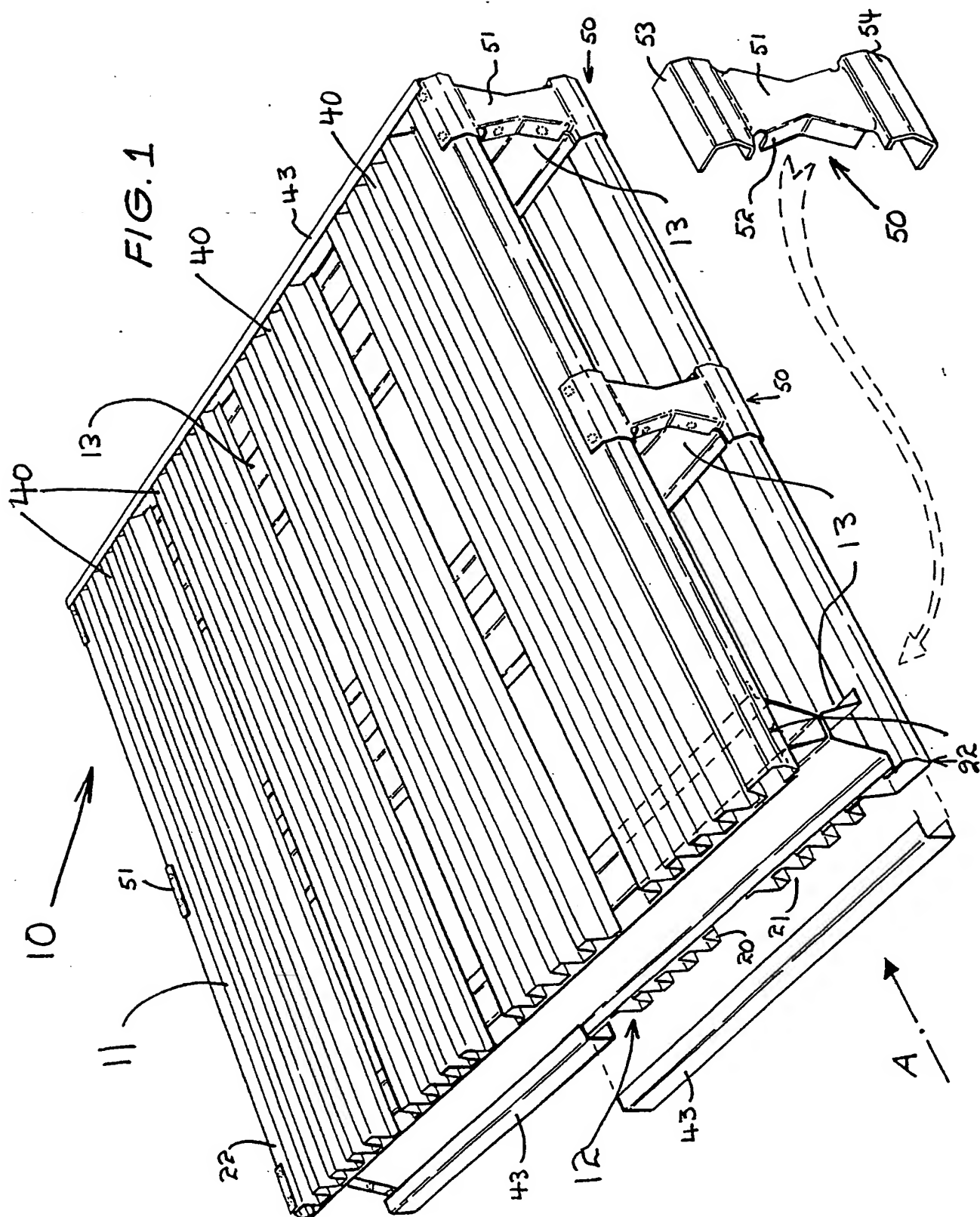
3. A material handling pallet according to claim 1 wherein each bearer is formed by welding two channel members together by their webs with the open face of each channel being outwardly directed.

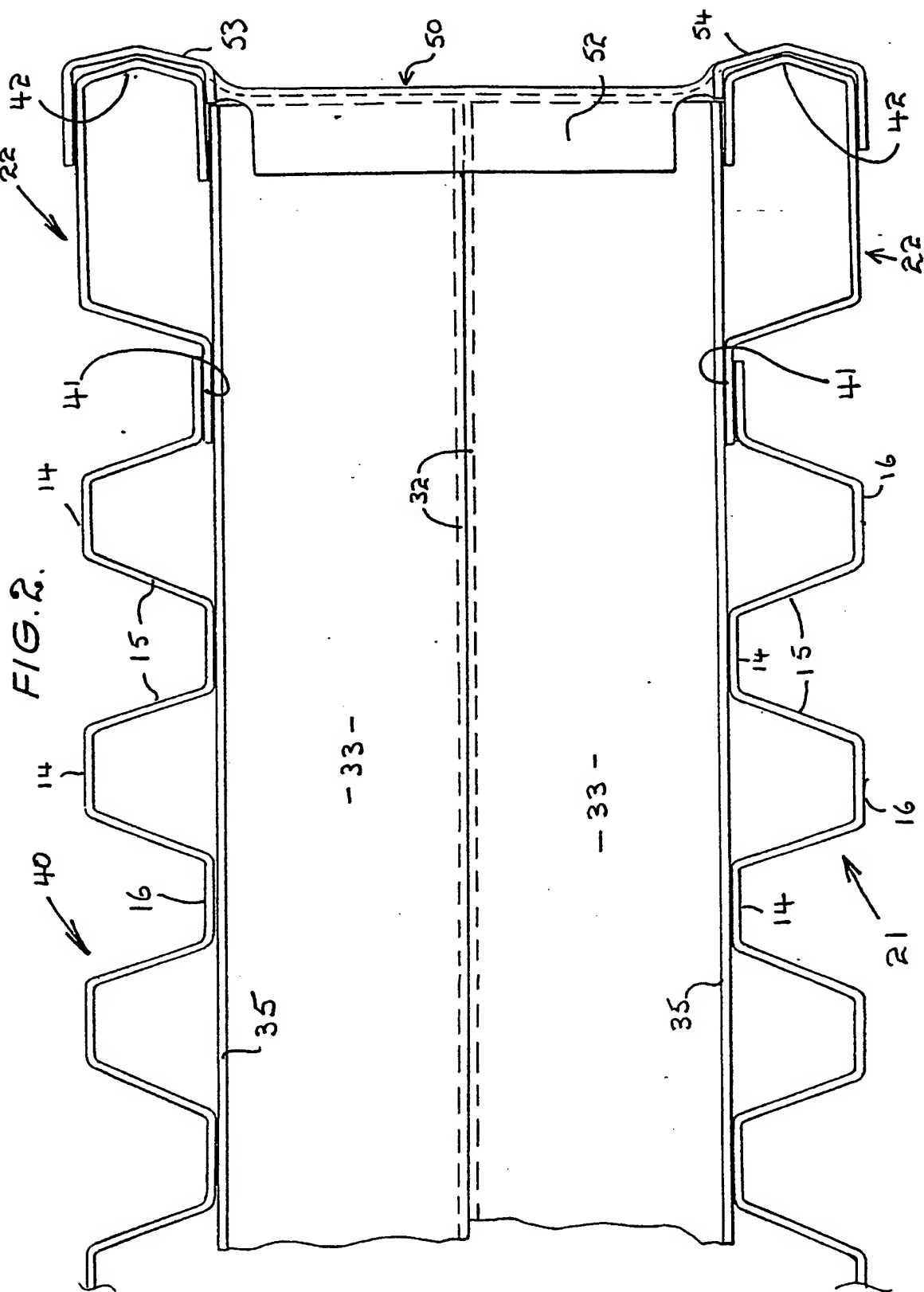
4. A material handling pallet according to claim 3 wherein the channel members have outwardly directed flanges at the free end of their legs and the outwardly directed flanges at the free end of the legs of the upper channel are welded to the pallet deck and the flanges of the lower channel are welded to the pallet base.

5. A material handling pallet according to claim 1 wherein the angle between the leg portions and the intermediate web is from 90° to 120°.

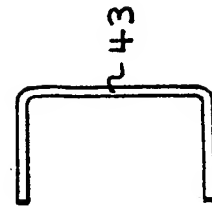
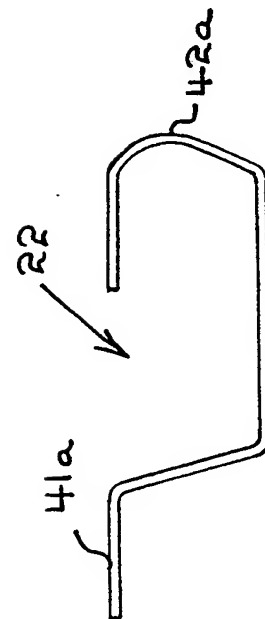
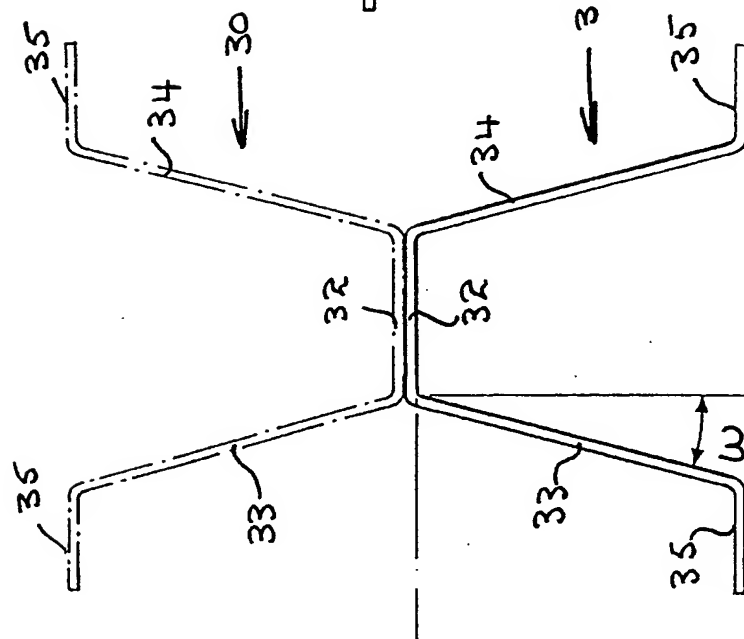
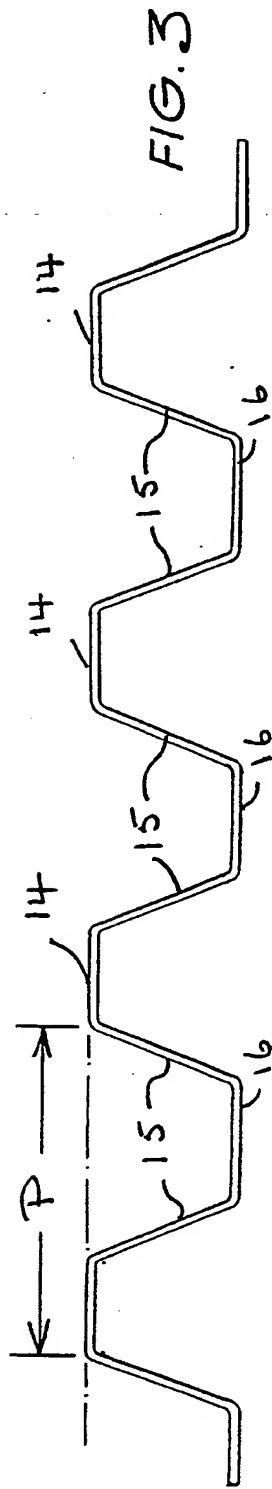
6. A material handling pallet according to claim 1 where the angle between each leg portion and the intermediate web is 105°.

7. A material handling pallet according to claim 3 wherein closure plates are secured to the end of the bearers.





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INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 85/00159

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ¹ According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. ⁴ B65D 19/28		
II. FIELDS SEARCHED Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC US Cl ²	B65D 19/28 108/52.1, 108/57.1, 108/901	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
AU: IPC as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	AU, A, 10693/47 (FORKTRUCKS PALLETS LTD) 14 Sept. 1948 (14.08.48)	(1-7)
A	US, A, 2699912 (CUSHMAN, WW) 18 Jan 1955 (18.01.55)	(1-5)
A	AU, A, 48122/79 (EXTRADOS CO. LTD) 3 Jan 1980 (03.01.80)	(1-5)
<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search 17 September 1985 (17.09.85)		Date of Mailing of this International Search Report (25-09-85) 25 SEPTEMBER 1985
International Searching Authority AUSTRALIAN PATENT OFFICE		Signature of Authorized Officer R. KIRBY <i>R. Kirby</i>

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
INTERNATIONAL APPLICATION NO. PCT/AU 85/00159

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Members			
AU 48122/79	BR 7903870	CA 1121287	CA 1141683		
	EP 6366	GB 2026431	MX 148275		
	NZ 190748	US 4382414	DE 2915460		
	IN 152710	JP 54142801	ZA 793013		

END OF ANNEX